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Declaration under Rule 4.17:

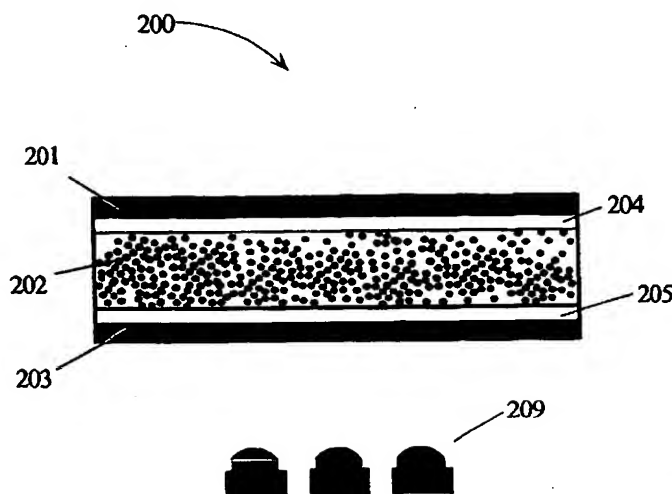
— of inventorship (Rule 4.17(iv)) for US only

Published:

— with international search report
— before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

[Continued on next page]

(54) Title: A FIELD SEQUENTIAL DISPLAY DEVICE AND METHODS OF FABRICATING SAME



(57) Abstract: A device adapted for use in a field sequential color display. The device may include first and second polarizers (201, 203). A light scattering material (202) may be disposed between the first and second polarizers (201, 203). Additionally, the display may include a light source (209) having a plurality of colors. Portions of the light scattering material (202) are operable for selectable excitation. An excitation of a portion of the light scattering material (202) is operable for controlling an amount of light of a color of the plurality of colors emitted by the display device. Further, sub-frames from which an image frame is composed may be addressed in a segmented fashion, whereby each sub-frame includes a plurality of segments. The light source (209) is correspondingly pulsed in a segmented fashion. A given segment may be illuminated in a different color in each sub-frame. In this way, perceived flicker may be reduced.



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4 March 2004

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US03/18762

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : G09G 3/36; G02F 1/1335

US CL : 345/87; 349/56,61,62,80

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 345/87; 349/56, 62,80

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category * | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|------------|--|-----------------------|
| A | US 5,751,388 A (LARSON) 12 May 1998, columns 4-6. | 1-23 |
| A,P | US 6,501,521 B2 (BATSUSHITA et al) 31 December 2002, column 7 line 45 to column 10 line 54). | 1-23 |

☐ Further documents are listed in the continuation of Box C.

☐ See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T"

later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X"

document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y"

document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&"

document member of the same patent family

Date of the actual completion of the international search

15 December 2003 (15.12.2003)

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/US03/18762

Box I Observations where certain claims were found unsearchable (Continuation of Item 1 of first sheet)

This international report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claim Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claim Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
3. ☐ Claim Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of Item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:
Please See Continuation Sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.: 1-23

Remark on Protest

☐
☐

The additional search fees were accompanied by the applicant's protest.

No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

PCT/US03/18762

BOX II. OBSERVATIONS WHERE UNITY OF INVENTION IS LACKING

The inventions listed as Groups I, II, III do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: the special technical feature of the Group I invention is the particular housing structure of an LCD device, the special technical feature of the Group II invention is a method of displaying an image frame, while the special technical feature of the Group III invention is a method for modifying an existing LCD. Since the special technical features of the Group I, II, III invention are different in each group, unity of invention is lacking.

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1. In order for all inventions to be examined, the appropriate additional examination fees must be paid.

Group I, claim(s) 1-23, drawn to a display device comprising a polarizer, a light source, and a light scattering material disposed in a transmission path between the polarizer and a light source.

Group II, claim(s) 25-28, drawn to a method of displaying an image frame.

Group III, claim(s) 29-30, drawn to a method for modifying an existing liquid crystal display device.